John J. Conery Preparing Hackberry for Filling *(Story page 12)*

Essential Characteristics of Insecticide Emulsions *Thaddeus Parr*

Arboriculture, Ohio Style *T. D. Neil*

Jan. - Feb., 1951 *The Journal of American Arboriculture* Vol. 11—No. 2

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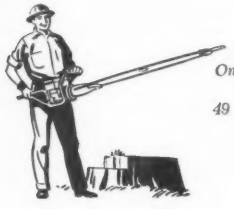

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TREES Magazine is a bi-monthly Journal published at Cleveland, Ohio, by Edward H. Scanlon, and is devoted to the furtherance of the technical and business administration of Trees (Street and Ornamental); Parks (Municipal and National); and Forests (State, National and Private), in the U. S. Scanlon Publishing Co., P. O. Box 5607, Cleveland, Ohio. Subscription by mail $2 per year; outside United States, $2.50. Advertising rates upon inquiry. Closing date for advertising copy—10th of month preceding date of issue. Unsolicited manuscripts must be accompanied by return postage.

ALONG THE WAY With . . . EDW. SCANLON

■ A VERY GOOD BULLETIN has recently come OUR WAY. Prepared by HAROLD PERKINS of the UNIVERSITY OF CONN., it is a CONCISE TREATMENT of "THE HOME LANDSCAPE—planning for use and beauty." Lots of SOUND TIPS on fundamentals. It is AVAILABLE FROM the University at STORRS, CONN.

■ *A note to our NEW SUBSCRIBER at WEST POINT—Don't ever SEND YOUR RENEWAL subscription in the MANNER JUST USED. My first thought, naturally, was that the COUNTRY HAD FORGOTTEN quickly that I HAD WON WORLD WAR "MIDDLE", and was again PUTTING THE FINGER on me. Next time USE A PLAIN ENVELOPE not one marked "DEPARTMENT OF THE ARMY" — the OLD HEART you know.*

■ If ANY OF YOU LADS have PERSONAL BOOK PLATES for your LIBRARY BOOKS why don't YOU SEND ONE TO US for PUBLICATION IN TREES. Should be very INTERESTING and INSTRUCTIVE.

■ *Every year AT XMAS TIME I enjoy the "report" LEON MILLER of ANGOL, CHILE sends to his FRIENDS IN THE U. S. A. This has BEEN GOING ON since 1935 when LEON gave such a NICE TALK on CHILEAN TREES at the WESTERN SHADE TREE CONFERENCE in SANTA BARBARA.*

■ MATCH THIS IF YOU CAN. In the "ABOUT YOUR HEALTH" column of a local paper, the other day, THIS QUESTION APPEARED—"What is the Dutch elm disease? We read about it in the newspapers yet no one ever says what it is or what the symptoms are." READER. The good DOCTOR CONDUCTING THE COLUMN REPLIED—"This is a disease of trees not of people. You will have to ask a tree specialist about this."—PROBABLY SOME HYPO WHO FIGURED DED MIGHT BE A NICE THING TO HAVE.

■ *I am DESOLATED—having just DISCOVERED THE LOSS of one of my FAVORITE PIPES—a nice BARLING POT BOWL. Even tho there are SIXTY OR SEVENTY OTHERS to draw CONSOLATION FROM, I wish this LITTLE SHEEP wou!d return TO THE FOLD.*

■ Notice, IN YOUR TRAVELS, the occurrence of a NICE SHAPELY GLOBE like form of RED MAPLE (A. RUBRUM). This form will be observed FREQUENTLY ENOUGH to indicate that CAREFUL SELECTION should result in a MARVELOUS TREE. It could well be classified as a DESIRABLE SMALL TREE although the species TYPE BECOMES QUITE LARGE.

■ *Now that wide awake ARBORISTS ASSOCIATION OF NEW JERSEY have a bill BEFORE THEIR LEGISLATURE to make the DOGWOOD THE OFFICIAL TREE of the state. HARRY BANKER sends the word that THEY'LL DO IT TOO.*

■ With ALL THE GOOD TREES in OHIO why did they pick the rather DINGY BUCKEYE?

■ *HORSE SENSE seems to have GONE OUT OF STYLE with the HORSE.*

■ I am EXTREMELY HAPPY to announce that BEGINNING in the NEXT ISSUE TREES will carry a SERIES OF TREE ARTICLES by the DISTINGUISHED ENGLISH horticulturist MR. W. M. CAMPBELL, CURATOR of the ROYAL BOTANIC GARDENS AT KEW. The series by MR. CAMPBELL will cover a DOZEN OR MORE of the small growing ASIATIC ACERS. MR. CAMPBELL says he has been a CONSTANT ADVOCATE of the planting of this TYPE OF TREE in his COUNTRY.

■ *AMONG THE ACERS we have asked MR. CAMPBELL to discuss ARE SOME we have LONG STUDIED AND ADMIRED in various PARTS OF THIS COUNTRY. These ENTIRELY HARDY and BEAUTIFUL LITTLE TREES (around 25 or 30 feet) such as, A. MIYABEI, A. BUERGUERIANUM, A. DAVIDI, A. TRUNCATUM, A. CARPINIFOLIUM and others are EXCELLENT POSSIBILITIES for RESIDENTIAL STREETS and SMALL HOME GROUNDS.*

■ Met some VERY VERY NICE GUYS at the IOWA NURSERYMEN'S ASSOCIATION meeting in DES MOINES several weeks ago. CLYDE HEARD was the BUSY MAN who kept things rolling and HIS SON BILL did a nice job OPERATING THE PROJECTOR for my NEW 3rd DIMENSION SLIDES. These slides ARE KNOCK-OUTS.

■ *Coming BACK ON THE PLANE were a number of the boys going to Chicago for the ILLINOIS NURSERYMEN'S MEETING. The President of the AMERICAN NURSERYMENS ASSOCIATION, WAYNE FERRIS and his VERY CHARMING WIFE —DAVE LAKE and his LOVELY MISSUS, had to put up with GENE BOERNER, VERN MARSHALL, HOWARD QUADLAND, CURT PORTERFIELD, KIM ANDREWS and BOB MULLISON.*

■ The HOSTESSES had a TERRIBLE TIME with KIM ANDREWS. He kept INSISTING on GIVING HIS SPEECH which had TO BE CANCELLED at the meeting because of TIME SHORTAGE. Better luck NEXT YEAR, KIM.

■ *It was good to hear again from JIM HUGHES whom we LAST SAW before the war at U. C. L. A. IN LOS ANGELES. JIM is nurserying at BISHOP, CAL. He got in TOUCH WITH US thru an old MICH. STATER DICK POTTER, and loyal subscriber, who is LIVING THERE. Small world, eh KIDS?*

■ A TREE you want to GET IN TOUCH with is AESCULUS CARNEA BRIOTTI, the red flowering horsechestnut. LOVELY, LOVELY. If only TREES COULD AFFORD color plates what WE COULDN'T DO in presenting SUCH TREASURES to you—Ah well 'TIS TOUGH to be poor.

■ *You WANT TO CATCH that DEBATE between VANCE SHIELD and ARCHIE PRICE at the MIDWESTERN SHADE TREE CONFERENCE Feb. 14 to 16 in Chicago. It should be WORTH THE PLANE FARE.*

■ PAUL LANGE of DELAVAN, WIS., has very generously PICKED UP the NATIONAL ARBOR DAY BALL and is running hard with it. He has a SPONSOR in the SENATE and we hope ALL YOU FAITHFUL arborists and nurserymen in WISCONSIN will plug to make YOUR STATE the TENTH TO ADOPT the "LAST FRIDAY IN APRIL" as Arbor Day.

■ *Again WE WILL TRY to get OHIO into the column of ARBOR DAY states. SENATOR JOSEPH R. NUTT, JR., an ARDENT CONSERVATIONIST, and member of the OHIO ASSEMBLY has kindly agreed to sponsor the "LAST FRIDAY IN APRIL" Arbor Day bill—so, PLEASE if you DO NOTHING ELSE but loaf the rest of the year, WRITE YOUR SENATOR AND ASSEMBLYMAN and ask him to VOTE FOR THIS BILL. We will send you the NUMBER OF THE BILL shortly.*

■ ATTENTION OHIO AND WISCONSIN readers—Get back of those "LAST FRIDAY IN APRIL" Arbor Day BILLS.

■ *Just LOOKING OUT THE WINDOW at two nice BLACK LOCUSTS alongside of RANCHO COSTA PLENTA, and I could almost catch the SCENT OF THEIR DELICIOUS PERFUME when in bloom. Some people DON'T LIKE THE BLACK LOCUST—they THINK IT'S MESSY. Nothing as BEAUTIFUL AND FRAGRANT in bloom can be CONSIDERED MESSY. Wish those WHITE FLOWERS would hurry and TAKE THE PLACE of that WHITE STUFF on the ground. BROTHER ITS COLD OUTSIDE.*

■ GORDON KING, Ass't. Prof. of Arboriculture at the UNIVERSITY OF MASS., is working hard on the arrangements for the TREE WARDENS, ARBORISTS AND UTILITY CONFERENCE March 26 to 30 at AMHERST. A splendid program has been lined up by GORDON. A feature will be the paper by JUDGE SIMONEAU, "New Tree Laws and the Registered Arborist."

■ *The first NEW YORK STATE ARBORISTS SCHOOL at CORNELL Jan. 15-16 was attended by 75 PRACTICING ARBORISTS. It was CONSIDERED A SUCCESS and will be renewed according to DR. A. M. S. PRIDHAM. Out of the meeting came the formation of the N. Y. STATE ARBORISTS ASS'N. with KEN PAINTER of BARTLETT as Chairman.*

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TREES MAGAZINE
Box 5607, Cleveland 1, Ohio

The Editors of TREES invite discussions, comments and all types of literary materials pertaining to trees and tree preservation from any person engaged either in the scientific advancement or commercial development of the field.

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January-February, 1951 **Journal of the National Arborist Association** Vol. 11—No. 2

EDWARD H. SCANLON, Editor
Box 5607, Cleveland 1, Ohio
Phone ADams 5-2357

"No place is complete without trees. A home without trees is charmless; a road without trees is shadeless; a park without trees is purposeless; *a country without trees is hopeless*"

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Out On A Limb

CLIMATE CONTROL MEANS TREE CONTROL

Something has happened in American horticulture in the past few years—and we think it is wonderful. It seems that there has been some rather serious thinking and evaluation of facts going on concerning the past uses of trees, shrubs and other plant materials.

Finally there has evolved a rather squally undeveloped youngster called "Climate Control." This child with the proper care, and loving attention from all its family—everyone in horticulture—should develop into the healthiest, most progressive thing that has ever happened in the history of ornamental plant use. It is science and common sense combining to make the aesthetic practical.

This is all to the good. It points up that to do this tremendous job of planting American homes we should do it so that vagrant or strong breezes are harnessed; sun rays are obstructed or deflected, and so on just to outline briefly the gist of the formula for Climate Control.

Into the planning for the development of the home grounds the first thing most people think of is a tree, or, ignoring space, trees. Here is where we come to the application of scientific selection in choosing a tree that will serve the needs of the owner. This need can be for a tree that will shade a certain spot where he wants a barbecue or a patio—it can be a tree that will cool a bedroom, kitchen or living room—it may be desired to protect from prevailing winds that are hot in summer.

There will be many variations of space available in which this tree must be accommodated without becoming a nuisance. To overcome such a problem the designer must first know, and then have available, a wide assortment of tree shapes and sizes to do this job of Climate Control creditably. But, it cannot be done unless the existence of many forms and shapes are known. Also the user must school himself in the careful selection of a tree by studious evaluation of the problem need. Any old tree will no longer do the job. We're growing up at last.

But with these growing pains come greater ones. Where can we find a wide assortment of fine small trees. We can't, but its coming. One thing we earnestly hope for is that the small Asiatic maples which have been growing in demonstration gardens thruout the country will finally be "found" and grown. Two of them especially would fit into this new scheme of things beautifully, they are Miyabei and Buerguerianum.

Along with the smaller umbrageous, or natural types we must have large and small globes, pyramids, uprights and, permit us to make a prediction, the Camperdown elm, or its prototype if carefully considered from a use and space standpoint is certain to come back in favor. It is unfortunate that utilitarian possibilities of this tree were overlooked years ago when it was no doubt sold as a freak or a curiosity. That is why we most always see it in company with the rapidly disappearing iron dog or reindeer on front lawns. We have seen

PLANT AMERICA

several places where people used this tree wisely and made for themselves a cozy little patio under its spreading garden crown.

More of this kind of tree use is due, especially on streets where in the past park trees were planted on streets and street trees, like the Wheatley elm, were planted in parks. Climate Control with trees is here.

CALENDAR OF EVENTS

Michigan Forestry and Park Ass'n., Union Building, Michigan State College Campus, East Lansing, Mich. Feb. 9.

* * * *

Midwestern Chapter, N.S.T.C., LaSalle Hotel, Chicago, Ill., Feb. 14-16.

* * * *

Midwest Institute of Park Executives, Chicago Park District Adm. Bldg., 424 E. 14th Blvd., Chicago, Ill., March 14-15.

* * * *

Southern Chapter, N.S.T.C., Palm Beach Biltmore Hotel, Palm Beach, Florida, March 22-23.

* * * *

Massachusetts Tree Wardens, Arborists and Utility Conference, University of Massachusetts, Amherst, Mass., March 26-30.

* * * *

Short Course on Roadside Development, Ohio State University, Columbus, Ohio, April 4-5-6-7.

Western Chapter, N.S.T.C., headquarter hotels, the Heathman and the New Heathman, Portland, Oregon, June 27-30.

A Thought For Today

He who plants an avenue of trees, cannot, in the nature of things enjoy them in their grandeur—He plants them for *America.

Much that we have and prize today comes of that attitude in our fathers. They did not make or build "to last their time," but rather that something worthy should mark their Passage—their good live after them. We, too, must keep this tradition of the things well done, that our children's children may be beholden to us.

—From The "Queen," December, 1950 (English Magazine)

**"England" in the original.*

Don Smith,
Div. of Parks and Forestry.
Columbus, Ohio

Not Easy To Move Hickory

Two years ago on May 5, Al DiPietro, of Farmington, Conn., moved a Hickory tree that was 5½" DBH and 29 feet tall. The picture taken in August (left) shows the nice recovery made by the tree which is being checked by Al and his foreman Wesley Belyea. The Hickory is a difficult tree to move and we hope Al will follow up with a story on the details and technique he employed.

Elgin Sweeper Company To Make Aero-Mist Sprayers

Reorganization of the Lawrence Aero-Mist Sprayer Company, Inc., of Greenfield, Massachusetts, with the object of having the manufacture of Aero-Mist Sprayers undertaken by Elgin Sweeper Company of Elgin, Illinois, has been completed according to Chester G. Parsons, President of the Illinois firm. Stockholders in the Lawrence Company recently approved a plan which called for the sale of the Lawrence assets to Elgin Sweeper Company, stock of the latter company being accepted in exchange by the Lawrence Company.

The action provides the nationally known Lawrence line of shade tree and orchard mist-sprayers with the resources and manufacturing experience of the long established Elgin Sweeper Company, leading manufacturer of automotive machines for street and catch basin cleaning. Although Aero-Mist Sprayers will continue to be manufactured in the Greenfield plant, production will be under the direct supervision of the Elgin Sweeper Company.

A newly formed company, Lawrence Aero-Mist Sprayer Corporation, will have complete charge of sales of Aero-Mist Sprayer for Elgin Sweeper Company. Nathan Tufts, Greenfield, Massachusetts has been elected President of Lawrence Aero-Mist Sprayer Corporation and Nelson T. Bagnell of Greenfield becomes Vice President and General Manager.

Silver Anniversary In Mich.

The Michigan Forestry and Park Ass'n will hold its Silver Anniversary meeting, Feb. 9 in East Lansing.

The meeting will be held in the Union Bldg., on the Michigan State College campus. The secy-treas., Carl Fenner says he doesn't know when the programs will be printed—if ever. But, be there anyway, maybe Carl will sing.

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Some Essential Characteristics of Insecticide Emulsions

By Thaddeus Parr
Senior Research Entomologist
Whitemarsh Research Laboratories
Pennsylvania Salt Manufacturing Co.

The use of emulsions and emulsion concentrates for control of some tree and shrub insect pests has been practiced for many years. The old kerosene washes and emulsions are good examples of the earlier materials. More recently, the emulsifiable oils have come into use for the control of scales and similar insects. Many or most of these materials, except some of the light summer oils, could not be used on trees and shrubs while foliate without danger of burning the leaves.

Emulsions of the proper types may be safely used on shade trees and shrubs, and this article is written to point out some of the desirable and undesirable characteristics of an emulsion concentrate that an operator should look for.

In order that everyone who reads this may be familiar with the basic principles which apply to the subject, it seems advisable at the beginning to define our terms and conditions. Practically speaking, an emulsion is a dispersion of small droplets of one liquid in another liquid, the two liquids being mutually insoluble. Since pure liquids which are mutually insoluble will not usually emulsify, a third mterial, the emulsifying agent or emulsifier, must be added to accomplish that purpose.

Different liquids or solvents require emulsifiers, and innumerable emulsifiers have been developed for different solvents and different uses of the same solvent. In instances where a third material (in this case an insecticide) is dissolved in the solvent, great care must be taken to select a solvent and emulsifier which will hold the third substance in solution under varying conditions of storage or which will redissolve the chemical readily at moderate temperature if some of it has crystallized out of solution under conditions of extreme cold. The solvent must also emulsify readily in a variety of common waters and remain an emulsion with relatively mild agitation. It should settle slowly and not "cream" to the top. It should re-emulsify readily after settling out.

Upon the type of solvent and emulsifier, too, depend the size and shape of the crystals of the solid (insecticide) which crystallizes out when the solvent and carrier (water) evaporate after application. Crystal size and shape have been shown to be of importance in toxicity to many insects. For example, the closely-meshed masses of fine, needle-like crystals of DDT are generally more effective than other types of deposits.

With the advent of DDT and some of the other chlorinated insecticides, solvents other than kerosene or similar oils were found necessary because of the low solubility of the insecticides in such oils. Solvents such as xylene, benzene, toluene, and higher flash-point materials like the methylated naphthalenes have come into wide use in insecticide emulsions. Even these materials, in too high a concentration and too heavy a dosage, will burn foliage. Consequently, it is desirable to have as high a concentration of insecticide in the solvent as is possible without destroying other desirable characteristics.

For a DDT emulsion concentrate, the maximum amount of DDT appears to be about 34 to 35 per cent by weight, or three pounds of insecticide per gallon. For BHC, the figure is somewhat lower, whether the concentrate is made from technical material or lindane, the difference being due to the different solubility of BHC or lindane. Formulations composed entirely of such solvents as benzene toluene, or carbon tetrachloride and DDT, even if they had desirable emulsion characeristics, would be undesirable from the standpoint of toxicity hazards from breathing the fumes, either in mixing or in spraying, and, except for the carbon tetrachloride formulation, would have a flash-point low enough to present a fire hazard.

One of the methylated naphthalenes alone might dissolve a suitable amount of insecticide and still be difficult to emulsify, or have undesirable drying characteristics, or be too phytotoxic. And, as is frequently the case in other chemical fields, the use of two entirely different solvents in the correct proportions may produce the desired results, i.e., satisfactory emulsion characteristics and stability, reasonably high flash-point, lower mammalian toxicity hazard from fumes, ease of re-emulsification, correct breaking and drying properties, and high insecticide solubility. These mixtures may vary in type of solvent and proportion of component solvents for each different insecticide.

In shade tree work, the stability of the finished emulsion is important. An emulsion concentrate may have sufficient emulsifier in the formula to form an emulsion (when mixed with water) that is stable for weeks, days, or hours. For some purposes such stability may be desirable, but for shade tree work in general, when the emulsion is mixed in the spray tank, such stability is excessive and uneconomical. Much spraying is done to the point of run-off, and drip or run-off from an emulsion of such stability carries a measurable amount of toxicant with it. For such work a stability of a few minutes to an hour is sufficient, and such a quick-breaking emulsion tends to leave more of the toxicant where it is wanted (on the foliage).

Another good reason for a minimum rather than a maximum of emulsifier in a formula is that excessive amounts of emulsifier tend to block or blanket the insecticidal action of the toxicant, thus requiring longer contact time for the insects to acquire a lethal dose.

A third reason for a minimum amount of emulsifier in a formula is the delay caused in evaporation of solvents by excessive amounts of emulsifier, which increases the possibility of such a formula being phytotoxic. This may be especially important where some flowers or other tender plants are growing under or in the vicinity of trees being sprayed and might be subject to drip or spray drift.

When an operator uses a mist blower or other concentrate application equipment, an emulsion concentrate is desired which may be diluted with a small amount of water without inversion; i.e., becoming a water in oil emulsion instead of an oil in water emulsion. Such a formulation should also be compatible with fuel oil or kerosene so that it might be diluted with one of them instead of water, when such mist application is desirable. The stability of the finished emulsion should be higher for the concentrate than is necessary for the dilute material in the hydraulic sprayer, since there is generally much less agitation in the tank in the concentrate equipment. Where the concentrate is mixed with an oil, no agitation in the tank should be necessary, since the liquids should, after the original mixing, form a stable solution.

Please mention TREES when writing Advertisers.

Gas Injury To Trees

(CONCLUSION)

By David H. Marsden,
Assistant Professor, Shade Tree Laboratories,
University of Massachusetts
Amherst, Massachusetts.

Contribution No. 783 of the Massachusetts Agricultural Experiment Station, Amherst, Massachusetts.

Continued from the Nov.-Dec., 1950 issue of TREES Magazine, Vol. 11, No. 1.

It is not uncommon to find the leaves on one or a few lateral branches wilting suddenly, probably because the large root which supplies that part of the tree is first affected by the gas in the soil. Then as the gas diffuses through the soil to involve more of the root system, the remaining foliage progressively dries out, curls up, and turns brown; abscission of the leaf usually occurs before total death ensues. On conifers, the needles turn orange-brown in color and are retained until jarred loose by strong winds.

Leaks which are not large enough to lead to this sudden wilting and death of the foliage of an affected tree, produce instead as symptoms, thin, chlorotic foliage which can best be discerned from a distance and contrasted with nearby healthy trees.

2. *Symptoms on the buds*—The buds on the affected parts of a tree usually dry out and die when the injury is severe enough to cause defoliation. Latent buds or adventitiously developed buds lower down on the branch or trunk may be stimulated to produce new growth with sparse foliage; a heavy sucker growth does not usually result with most species, but has been observed to occur on some gas injured American elms (2).

With small potted trees, it has been shown experimentally that the exposure of the roots or tops of these trees to gas resulted in the precocious development of dormant buds (1). The stimulation of dormant buds causing early leaf-out in the spring may occur in mature shade trees for the same reason.

The presence of dead buds on a tree in winter may be the only visible symptoms of a gas leak at that time.

3. *Symptoms on the Woody Parts*—The distal portions of gas-injured trees are usually affected first. Especially is this true where the concentration of gas around the roots is not built up rapidly and is not strong enough to cause a sudden wilting over the most of the crown. This die-back effect in the crown is the typical response to most kinds of root injury of which gassing is one. Thus the symptoms are easily confused with those caused by other agencies previously mentioned.

(Photo by R. L. Coffin)

Loosened bark is easily stripped from some gas-killed trees. This maple had died two months previously from gas injury.

Gas-injured trees, however, apparently are more quickly invaded with borers and saprophytic fungi, and the fruiting bodies of the latter soon make their appearance on the affected branches. Moreover, it is common for the bark of the trunk and larger branches of certain trees (maple, elm, ash, poplar) to split longitudinally and for large pieces to loosen from the wood. A bluish discoloration of the underlying wood may sometimes be observed, but, contrary to what some people believe, this is not in itself a reliable diagnostic character. Because of an unexplained brittleness of the wood and bark and their high susceptibility to saprophytic organisms, gas-killed trees deteriorate rapidly indeed.

The formation of irregular bark cankers ("rosy canker") on the trunk and larger branches of the London plane tree has been reported to result from gas injury.

It is claimed that the wood of gas-injured trees has a slight but distinctive odor. This may be so, but odors are difficult to describe, and in his experiences the writer has not been able to confirm this popular belief.

An examination of the growth rings of a tree by extracting a small core of wood with an increment borer is often desirable. The width of successive growth rings will show whether the tree has declined slowly in growth or whether a sudden injury is rejected in the amount of wood laid down in any one year. Correlated with known weather conditions over the previous years, and other observed evidence, this increment record may be used to determine the probable time of initiation and the duration of the gas injury, and somewhat of the vigor of the tree prior to the injury.

4. *Symptoms on the roots*—It is not often easy to make an adequate examination of the root system of a tree, but certain cases will warrant that the effort be made. As would be expected, the roots nearest the leak are injured most severely. The roots die back from the tips, and the cortex sloughs off readily when such roots are pulled up for examination. A bluish or pink discoloration of the wood may often be observed, but this may also be caused by decay organisms.

Slight traces of gas in the soil are said to cause a prolification of the cortex of small rootlets, giving them a swollen appearance when compared to normal rootlets. The formation of adventitious rootlets may also be induced. It has been reported that slight injury is accompanied by the depletion of stored starch in the cortical cells (11), a phenomenon which supposedly could be observed by staining thin sections with iodine and examining with a microscope. It is theorized that the depletion of the starch is a result of intramolecular respiration.

5. *Unusual symptoms*—A few cases of distinct gas injury to trees seen by the writer, have had such bizarre symptoms as to be worthy of special note. It is emphasized here that these symptoms are not unique for gas injury. They can result from root disturbances due to agencies other than gas, and perhaps can be caused through other means as well.

The trees involved in gas leaks were red maples and silver maples. In addition to a marked chlorotic mottling of the leaves, the wood and bark of the trunks and branches of these trees were

(Continued on page 20)

Resurrect Exotic Trees Is Committee Program

By Edward H. Scanlon, *Chairman*
Shade Tree Selection Committee
National Shade Tree Conference

The splendid response from members of the National Shade Tree Conference and the American Nurserymens Association that met the announcement of the program projected, last year, to find better shade trees, was certainly gratifying. Some really beautiful forms of various species were sent to the committee and later displayed at the Shade Tree Conference in Syracuse.

The Shade Tree Selection Committee, which was originally known as the Arboretum Committee, hopes that people interested in this project, and that should be everyone, will get to work immediately and get some winter pictures of their candidates for the "trees of the future" program. A summer picture, both 8x10 glossy, should also be recorded of the tree so that a presentation like that made at Syracuse (see picture) can be made in Cincinnati next summer.

While it is intended to continue and strongly encourage the effort to find many more select natives, the major objective this year will be directed toward exotics. The concurrence of the committee on this agenda is 100%. The feeling is that we have been driving spikes with a tack hammer in trying to do a scientific planting job with just a partial kit of tools. Therefore our native species must be augmented with every exotic that it is possible to grow in this country.

In spite of the fact that there has long prevailed a school of thought that could not, and would not, look beyond a native when seeking a tree, we have come to a face to face meeting with the reality that our natives are taking a horrible beating; that there is little we can do about it without substantial, and intelligent endeavor for a change, spending by the government for research, and that we should quit deluding ourselves that a native is still a native out of its natural habitat. It isn't.

With World War III well under way, it is most certainly a waste of even wishful thinking to hold out any hope for government research appropriations. They wouldn't even do it in peace time. Therefore an effort to strongly bring to the front the many splendid exotics and their qualities,

(Photo Courtesy National Shade Tree Conference)

This is the exhibit displayed by the Shade Tree Selection Committee (formerly Arboretum Committee) at the National Shade Tree Conference in Syracuse last summer. A similar, and we hope, larger display will be made at the Cincinnati meeting.

which in many respects are superior to the natives, seemed to the committee an altogether common sense approach to our selection program.

Dr. Ernst J. Schreiner, Geneticist of the U. S. Forest Service, and technical advisor to the Selection Committee, has two possibilities in connection with the exotics that should be kept in mind by collaborators who assemble data on the various species.

1. The possibility of seed propagation of certain exotics which have shown uniformly good growth and development in this country.

2. Vegetation of individual trees of exotic species which have demonstrated greater diversity in growth and development.

If it is possible for the committee to make arrangements for the growing of some of the more desirable specimens it would be valuable to know that seed, buds or scions could be obtained from the trees submitted. In filling out blanks please indicate such possibilities. blanks (send for blanks) please indicate such possibilities.

Among the exotics that should be explored thoroughly and case histories made of are the small growing Asiatic *Acers* such as: *A. buerguerianum, Miyabei, truncatum, laetum, Davidi* and *capillipes,* just to name a few. An American species that should be known comes to mind here, it is *Acer grandidentatum* native to the Rocky mountain region. Observed growing in Rochester's Highland Park it makes a beautiful pyramidal shaped tree, this one at least 30 feet tall. Continuing with the exotics, we should be on the lookout for a fruitless form of *Sophora japonica.* Dave Petrie, Boise, Idaho, informs us he has a late flowering (August) form of *Koelreuteria paniculata.* There is a fruitless form of *Phellodendron lavallei* in Henry Skinner's Morris Arboretum. These few examples of desirable trees indicate that by careful observation and some action we can do some wonderful things with trees on streets, in parks and for small home grounds.

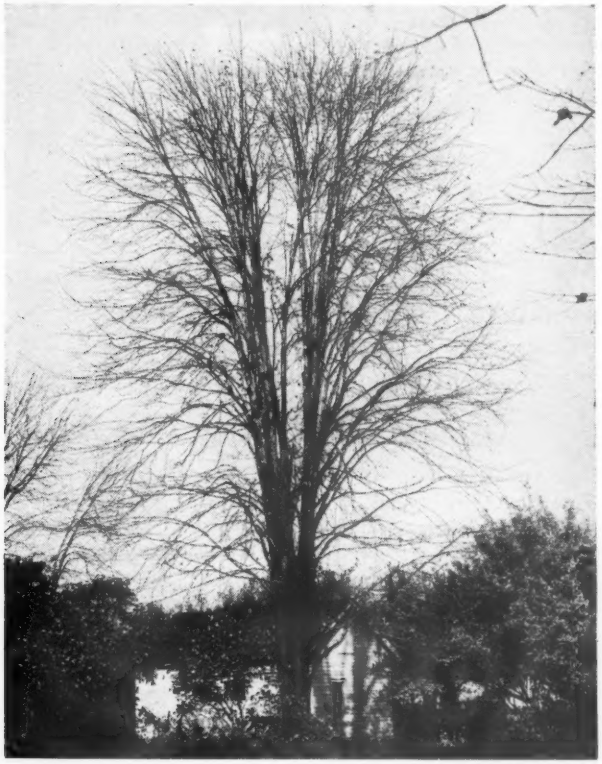
There are four Lindens that deserve very special consideration and certainly much wider acceptance than they have received. *Tilia cordata,* a specimen of which is pictured here in summer and winter form, should come in for some

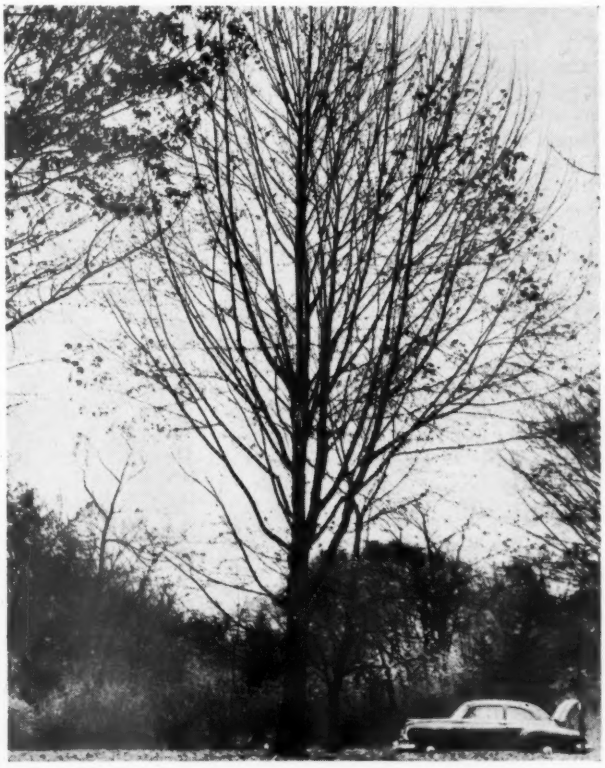
(Continued on page 25)

Patronize the Advertizers. Mention TREES

SHADE TREE SELECTION PROGRAM

The above pictures of a nice compact Littleleaf Linden (Tilia Cordata) were contributed to the program by Committee Member Martin Chaisson, City Forester of Kansas City. Proper nursery training could make this a fine tree with a higher crown suitable for a wider scope of use.—To the left below is a form of silver maple (A. saccharinum) that indicates the possibilities of finding worthwhile selections in this species. Lower right is a very large, 45 feet tall, compact, oval form of Norway maple (A. Platanoides) that is a distinctly worthwhile tree.





PLANT AMERICA

Arboriculture, Ohio Style

By T. D. Neil,
Karl Kuemmerling Inc., Canton, Ohio

Ohio State, loser to Michigan in the battle of the "Snow Storm" is a strong contender in the fight to keep forever alive the trees and forests of America.

Twenty-two young men of the Buckeye Institution stand ready, willing and able to test the best the opposition has to offer after absorbing the best in education, advice and experience Professors Chadwick and Mathieu have to offer in the way of arboriculture.

Arming these future guardians of our forests with knowledge on shade tree anatomy and physiology, safety practices, rope knots and climbing, pruning, tree removing and line clearance, cabling and bracing, treatment of tree cavities, soils, fertilization, transplanting, diagnosis of tree disorders, insect and disease control, treatment of cuts and fills, lightning protection and the business management end of arboriculture practically runs the gauntlet of tree disorders.

We firmly believe from the fundamentals covered and the plays safely stored away for the day they can be used against the opposition, fielding a team from such a group is not only an easy task, but a pleasure to look forward to.

Occasionally professionals are invited to exhibit a few tricks learned while in the field. Karl Kuemmerling had the pleasure of returning to his alma mater to give the "Bucks" of Ohio State a little history of the game. Two of Kuemmerling's boys, "Mont" Hollingsworth and "Buss" Toothman put on a half time show for the audience, proving that good climbing and experienced roping are much in demand if you want to be an all-out player in the game.

The coaches at State believe in actual contact workouts and from what scrimmages we watched, the present crop of talent will cause many of the old standard names in the business to go on the offensive or become forgotten people.

Likable, good natured, pipe smoking "Chad" has been seeing men of State crossing the goal line since 1937 when he took over State in 1933. A recent welcome addition to the staff in the person of Professor T. F. Mathieu gives State a real unbeatable combination. Massachusetts' loss is Ohio's gain.

Many states outside of Ohio will benefit from the learning and know how these boys will be taking along with them to home town, home state, U. S. A. California is represented in the person of Roy Yoshimura; M. M. Eckstein represents New York state; T. W. Reynolds calls Idaho his home state while T. W. Flowers completes the crisscross section of America by being from South Carolina. The need for educated, experienced men in the field of arboriculture is growing steadily as government, industry and just plain John Doe decides that much of our future lies in the preservation of trees and forests and are backing up the idea with money, good positions and advanced tools to do the job expected of them.

To the Universities and Colleges of America teaching arboriculture, we salute you. Future results will more than pay for today's efforts.

Top right—Shades of Ireland (Eds note: It should be England, this Irish ain't Irish) another Irish, Charlie, Jr., breaking into the act, while W. A. Kroger gives with the "pepsodent." Below — Group picture of students with exception of two fellows who were absent the day the pictures were taken. Front Row reading left to right, Karl Kuemmerling, R. H. Messmore, Ohio; J. S. Heider, Indiana; W. H. Lindberg, Kentucky; Roy Yoshimura, California; R. V. Will, Ohio; M. C. Twigg, Maryland; D. E. Dietz, Ohio; R. J. Hanzel, Ohio; Ray Toothman. Back Row reading left to right, M. Hollingsworth, T. F. Mathieu, Massachusetts; Ass't. Professor of Horticulture, O. S. U.; T. W. Flowers, So. Carolina; W. N. Endicott, Ohio; A. C. Madry, Ohio; T. W. Reynolds, Idaho; W. H. Shroyer, Ohio; C. F. Irish, Jr., Ohio; L. R. Birkmeyer, Ohio; W. A. Kroger, Washington; Ray Martin, Ohio; M. M. Eckstein, New York; E. E. Wollman, Ohio; L. C. Chadwick, Professor of Horticulture, O. S. U.

Data On Trade Name Insecticides

VERDOL Summer Spray Oil

Standard Oil Company, (Indiana), 910 South Michigan Ave., Chicago, Ill.

VERDOL is a carefully prepared, highly refined, white oil emulsion of the cream or mayonnaise type. The base oil is a technical white oil, refined to remove the elements that might injure growing vegetation. The other ingredients of the finished emulsion, incorporated to make the oil mixable with water for spraying are bland, neutral substances that possess maximum safety to trees and plants. *The entire VERDOL composition is designed to produce a summer spray oil that is the safest it has been thus far possible to develop. VERDOL should always be mixed with water.*

VERDOL is used alone to control many kinds of summer insect forms such as red spider on evergreens, all kinds of scale crawlers, leafhoppers, white fly, and certain adult scales, among many others.

VERDOL is also used as an additive agent incorporated with nicotine or other contact spray insecticides to control the active forms of various sucking insects, such as aphids, leafhoppers, mealybugs, white flies, lace-wing bugs, etc. Because of the increased potency of oil-nicotine combinations, the addition of VERDOL permits reduction of the concentration of the nicotine toxicant.

VERDOL is used to a considerable extent in standard summer shade tree spraying in combination with lead arsenate. VERDOL improves the deposit, coverage, resistance to weathering of the lead arsenate, thus greatly adding to the effectiveness of the spray.

Typical recommendations of VERDOL on a few common representative insects are as follows:

	Amts. per 100 gals. water
San Jose Crawlers	2 gal.
Oyster Shell Scale Crawlers	2 gal.
European Elm Scale Crawlers	2 gal.
Cankerworms, etc. VERDOL	1 gal.
Lead Arsenate	3 lbs.
Aphids VERDOL	1 gal.
Soap	4 lbs.
Nicotine sulphate	⅓ pt.

(Continued on Page 16)

with

SHELL DDT OIL MIST INSECTICIDES

SHELL MISTONAS—for economical large-scale usage

Shell Mistonas atomize readily and produce a far-carrying, close-clinging mist that deposits an effective residue high in the tree. That's because of the special base oils used. These Mistonas are very economical to use due to the relatively large proportions of DDT they contain. They are ideal for covering big areas by aircraft, high velocity blowers or similar equipment.

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This widely-used insecticide (containing 25% DDT) economically controls many harmful pests . . . including elm leaf beetle, tussock moth, canker worm and webworm. Shell Resitox D-25 emulsifies readily in water with little agitation . . . is equally effective as a concentrate in atomizing equipment. Ideal for early season use.

See your local representative or write for further information.

FOR DUTCH ELM DISEASE. To prevent the spread of the Dutch Elm fungus, control the Elm Bark Beetle with Shell Mistona sprayed just prior to leaf formation. After foliage has formed, spray Shell Vapona to control subsequent broods.

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NAA NEWS

By PAUL E. TILFORD, *Secretary*
Box 426, Wooster, Ohio

Filling Tree Cavities

Controversial subjects are always of interest to me. It is when there is a difference of honest opinion that progress is made. When everyone agrees 100 percent on a thing there is no chance for improvement until someone learns that what was thought to be true is not always absolutely true. Then the argument starts and usually some new ideas and better understandings develop and advancement is made.

To fill tree cavities or leave them open has been a subject for hot debate among arborists for a long time with some excellent men lined up on each side. These differences in views have certainly had an effect on cavity treatment. There was a time when most shade tree work consisted of installing fillings. Today the filling of cavities constitutes a relatively small percentage of tree work and it probably occupies a place more indicative of its true importance than formerly.

Without entering into any arguments, I am just going to say that in my opinion there are times when the filling of a cavity is not only justified but is the best thing to do. Two such cases are shown in the accompanying pictures of work by John Conery at Rockford, Illinois. The hackberry was struck by lightning. A wire was attached to an old-fashioned insulator which the tree had partly grown around. The bolt of lightning came in on the wire and on its way to the ground ripped the trunk of the tree. After it was evident that the tree would survive the filling was put in. There was no extensive decay to contend with. The owner of the tree, an industrial company, wanted the tree repaired in this way rather than with an open cavity along the length of the trunk. The second picture of the tree taken the following summer shows the tree in full leaf and it appears to be in a vigorous condition.

The 14" elm had grown entirely around a 4" elm sapling at the base. The section of the sapling enclosed by the larger tree was in a petrified condition when it was removed. Rot invaded the larger elm around the place where it encased the sapling and this rot extended up about 8' on the trunk. Again, the owners of the tree wanted it repaired this way.

In addition to doing good cavity work, John Conery has learned the value of good pictures as a record of his work and as aids in selling.

The 14" elm referred to in the text is shown here dug, braced and being painted prior to filling.

The same elm filled with a very handsome workmanlike job.

Don't Give Up the Ship Boys
EX-MAYOR KELLY STARTED ON CHICAGO PAYROLL AS TREE CUTTER

Chicago—Edward J. Kelly, former Chicago mayor and Democratic leader, left an estate estimated at $600,000, his will showed. His widow, Margaret, is sole beneficiary. Kelly 74, died Oct. 20.

Kelly was mayor 13 years at a $17,500-a-year salary until he retired in 1947. Previously he worked for the sanitary district and the South Park board. He rose from a tree cutter to chief engineer of the district.

Hackberry struck by lightning, as described in text. This is another excellent cavity job by the John J. Conery Tree Experts of Rockford, Ill. The cover picture shows the tree before filling.

New Double Cut Pruner

A brand new double-cut "Professional" type pruner is now offered by Seymour Smith & Son, Inc. and described as the finest of its type anywhere.

The "double-cut" action cuts from both sides and avoids any bark injury, making a clean, close, quick,healing cut.

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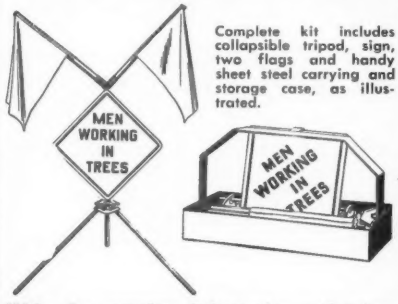

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Your annual war against insects is about to begin. Right now is undoubtedly the one season of the year when there is time to study better ways of controlling the many worms and beetles that plague shade trees from coast to coast. This year check the many advantages of Pennsalt DDT Emulsion Concentrate 34 against the spray you used last year.

Arborists everywhere are realizing the convenience and safety offered by Pennsalt DDT Emulsion Concentrate 34. This versatile material can be dispersed from hydraulic or mist concentrate equipment in easily prepared, stable water emulsions. Because of the lower solvent content as compared to 25% materials, the danger of foliage burn is reduced. And mixes containing a known weight of DDT are simple to make up—just use ⅓ of a gallon of Emulsion Concentrate 34 for each pound of DDT required in the final mixture.

For a *safe*, effective DDT emulsion for controlling many shade tree pests, choose Pennsalt DDT Emulsion Concentrate 34, made by a basic manufacturer of agricultural chemicals. New Bulletin 201 describes the use of Pennsalt DDT Emulsion Concentrate 34 on shade trees. Send for your copy today.

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Atkins People Meet

Executives and Salesmen of E. C. Atkins and Company, Indianapolis saw manufacturer, attend sales conference at Chicago (Picture at left). From left to right, first row—C. E. Drake, T. W. Potter, R. W. Atkins, First Vice President in Charge of Sales, William Gustafson, A. M. Coleman, R. M. McNamara, N. H. Milam, W. E. Rollinson, H. Waddle, Manager Mill Sales Division, M. A. Bauer, P. P. Sparkling, B. L. Owens, Manager Chicago Branch Office. Second row—A. C. Granum, R. R. Glenn, Glenn - Jordan - Stoetzel Advertising Agency, L. C. Smith, R. W. Nightengale, W. N. Springer, Jr., G. H. Schimmel, R. S. Diener, Frank Reis, A. B. Winter, Augustus Vogel, Manager File Sales, R. A. Arbuckle Back row—O. H. Clampitt, C. A. Woody, Ass't. General Sales Manager, A. L. Martin-J. M. Munroe, B. S. Mitchell, R. F. Ellis, son, Manager Hardware Sales.

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Pruner poles in 10, 12, 14 ft. lengths. Now is the time to get them.

Saddles up slightly—may be higher.

ORDER BOOTS AND CLOTHING NOW

PRICES MAY GO HIGHER

Insecticide Data

(Continued from page 11)

SUPERLA Summer Spray is a clear, fluid, light colored material containing 97.3% carefully refined technical white oil. Because of the high degree of refinement of the base oil component, SUPERLA is finding considerable use by park officials, nurserymen, and others in certain phases of shade tree and shrubbery insect control work. SUPERLA is probably used more in combination with lead arsenate on certain plants to control the ravages of such leaf-eating insects as cankerworms, tussock moths, etc., than by any other method. Many spray operators are using SUPERLA as a source of technical white oil for combining with DDT concentrates for use in mist sprayer applications. The addition of white oils to these high concentration DDT emulsion formulations adds greatly to the carrying or penetration characteristics of the spray when used in mist sprayers, and their use also results in improved aphid and mite control.

STANDARD 25% DDT Concentrate is a light-amber colored, readily flowable liquid, which is always diluted with water before using. This product consists of DDT having a minimum setting point of 89° C, dissolved in an xylene solvent of low toxicity to plants to which a combination of emulsifiers has been added. Sufficient solvent is used to prevent the DDT from coming out of the solution at —30° F. The emulsifiers are designed to give maximum emulsion stability.

STANDARD 25% DDT Concentrate can be diluted with water for use in a mist or hydraulic sprayer. In certain spray work, especially in mist spraying of tall shade trees, SUPERLA Summer Spray Oil or Acme White Oil, a Standard Oil Company (Indiana product) can be added to the STAND-

PLANT AMERICA

ARD 25% DDT Concentrate to give an improved formula.

When STANDARD 25% DDT Concentrate and SUPERLA Summer Oil are used in combination in a mist sprayer, the resulting formula is essentially equivalent to mist sprayer Formula C developed by the USDA for control of certain insects of elms.

STANDARD 25% DDT Concentrate can be used in general shade tree insect control work wherever DDT is recommended for control.

DENDROL is a clear, free-flowing, concentrated, reddish-colored, liquid, dormant spray oil which has been on the market since 1923. It contains 98.2% active petroleum ingredients and is made from a well refined light grade oil. It is a miscible type spray oil, in that it mixes instantaneously with water, forming a milk-white emulsion which will not separate for a considerable time.

Used by park officials, nurserymen, custom sprayers, fruit growers and others to control a wide range of insects on shade trees, shrubbery and fruit trees in the dormant period.

The product gives positive mixing and because of the uniform character of the emulsion, DENDROL is recognized as being one of the safest dormant oils that can be used.

DENDROL possesses a high degree of killing power because, while the emulsion is stable at all times, it "breaks" quickly when sprayed, allowing the oil to stick to the bark surfaces and letting the water run off. DENDROL also has powerful wetting and spreading properties.

DENDROL has been recognized as the premium dormant spray oil on the market for over a 24-year period.

The strengths generally recommended for use in a conventional hydraulic sprayer vary according to the kinds of insects to be controlled and the kinds of trees and shrubs to be sprayed. The strengths generally recommended vary from about 2½ to 7 gallons of DENDROL in 97½ to 93 gallons of water to make 100 gallons of spray. Explicit dilutions or dosage recommendations for various kinds of insects and trees are included on the product label copy or can be had by securing DENDROL bulletins and pamphlets provided by the Standard Oil Company (Indiana).

Typical recommendations on a few common insects, among the many insects controlled by DENDROL, are as follows:

	Amounts per 100 gals. water
Oyster Shell Scale	6 to 7 gal.
Putnam Scale	2½ gal.
San Jose Scale	2½ gal.
Cottony Maple Scale	4 gal.
Scurfy Scale	4 to 6 gal.

DISSTON ANNOUNCES

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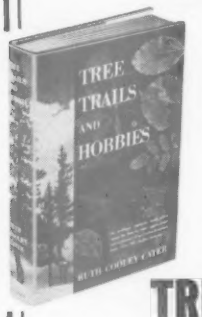

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I Think That I Shall Plant a Tree

By HARRY E. TURNER
Secretary-Forester,
Shade Tree Commission
East Orange, New Jersey

If it were possible for you as a City Forester or one in charge of the trees in your city to go about your streets with a magic wand and change the entire complexion of your streets by putting your trees in order, you would be voted number one citizen in your town or city. I dare say, you would make many changes before you were finished with your job. Of course, this tree-man's Utopia is impossible, and for that reason we should be extremely careful and use great foresight when we select and plant our street trees in order that this planting will be a monument to our work long after we have passed on.

Before you plant a tree, you should ask yourself what you require of that tree and what are its' characteristics. You should further ask yourself: is your selection hardy enough to withstand the unfavorable conditions usually found along the average street where there is poor soil, not much moisture due to concrete sidewalks and patented pavement, gases, winds and reflected summer heat; is it a clean tree or will its fruit be messy and dangerous underfoot; will this tree have a moderate growth and a long natural life; will it give an abundance of shade without an unreasonable amount of pruning and maintenance; will it be able to adapt itself to this location and will it grow well in this climate; is it subject to many insect attacks and can it be transplanted with a low percentage of loss; and last but not least, how will this tree suit the location when it has matured and how will it fit with the proposed buildings.

If a tree is planted in a metropolitan area then the Forester must consider these facts in addition to those already mentioned; will this street be widened for business in the near future? If there are possibilities of this, the tree should be planted further back from the curb line so that the roots will not be destroyed when the widening takes place. Will there be sufficient space between trees when they have matured to allow a fire department to ladder a building. Are they far enough back from the curb so that large trucks, trailers and mechanical sweepers will not damage the lower limbs; how will the shape, height and location of this tree affect the street lighting and possible overhead line clearance; is it planted far enough away from the radius curb so as not to obstruct the vision of motorists; will this tree block the store fronts and signs from the view of passing motorists; will the roots raise the sidewalk or get down into house connections or drains. These are a few of the points which we must consider when we plant a tree, bearing in mind that the merchant must be given some consideration, because the money he pays in taxes goes toward making up our budget. After all of these facts are considered, then the selection of the tree is made from the available varieties.

Yes, there are places where Sycamores are planted on a narrow street and only ten feet apart, and there many examples of poor foresight and planning and planting. In many cases it wasn't wholly the planter's fault, since his choice of available type, shape and species was limited and he had to take what the nurserymen offered. It is my earnest hope that some nurseryman will come out with a variety of trees which we can plant on our streets in business sections that will have all of these desirable qualities and characteristics. I am sure that he would find a big market for his product and his find would pay a nice dividend.

It is from these errors that we should learn our lesson and give more care and thought to street tree planting in order to beautify our cities and America.

Tenth Annual Conference on Roadside Development

The Ohio State University
Columbus, Ohio
April 4, 5, 6, 7, 1951

The Tenth Annual Short Course on Roadside Development will be held on the above dates, starting at 1 p. m. on Wednesday, April 4. Registration will begin at 9 a. m., in the main corridor of the Departments of State Building, followed by a dedication of a Roadside Park honoring Dallas D. Dupre, Jr., former Chief Landscape Architect for the Ohio Department of Highways.

An inspection trip, a regular part of the Short Course, will be conducted on Friday, April 6 and Saturday, April 7.

For further details apply to Mr. Charles R. Sutton, Department of Architecture and Landscape Architecture, The Ohio State University, Columbus 10, Ohio, or Wilbur J. Garmhausen, Chief Landscape Architect, Department of Highways, Columbus 15, Ohio.

Make your hotel reservations early.

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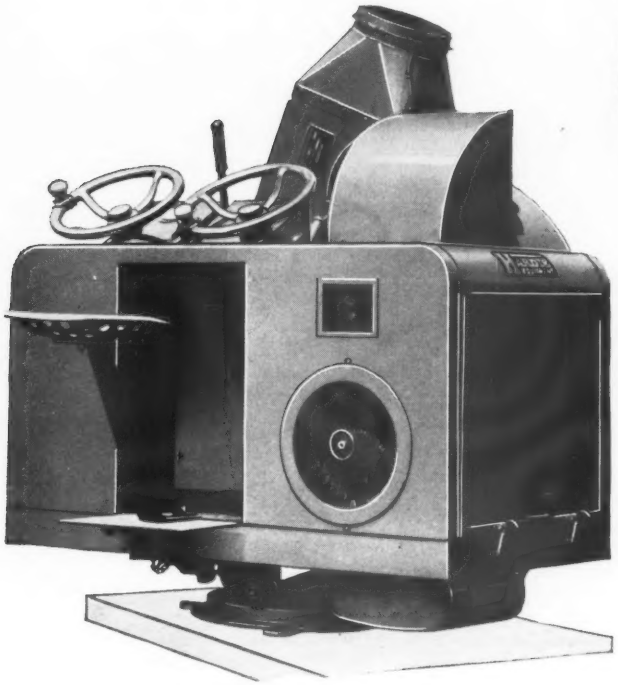

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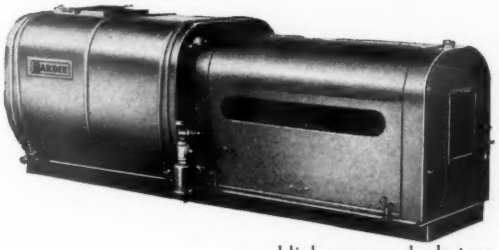

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Gas Injury

(Continued from page 7)

slit in numerous places, and from these slits copious quantities of sap were foaming out and dropping, like great blobs of frothy spittle, to the ground. The pressure behind the foaming sap was such that a distinct hissing sound was audible. The aroma of the fermented sap was not unlike that to be smelled in the vicinity of a brewery, and swarms or flies and bees were attracted to the trees. Apparently the sap had fermented with the result that enough gas pressure had been built up to break through the wood and bark.

IV. *Remedies for Gas Injury to Trees*

It cannot be emphasized too strongly that it is far better to detect and repair a gas leak before *any symptoms* of injury are visible on a tree than to try to remedy or cure a tree already showing symptoms of injury, no matter how slight. The dead tree in the center foreground of the photograph illustrating this paper had only a few branches with wilted leaves when attention was first called to the tree by the gas company. This was early in summer and the leak had been repaired. Despite attempts to alleviate the damage by aerating the soil and pouring many gallons of water into dug holes, the injury progressed and involved other trees, until at the end of summer the damage was as extensive as described and pictured above. It is possible and practical to spot leaks before irreparable damage is done. The gas companies are earnestly interested in preventing injury to valuable shade trees and other vegetation. Most companies have at present an active program of annual systematic surveys designed to discover and repair incipient leaks. Most companies, too, will be found to be very cooperative in working with others who are interested in preventing gas injury. Property owners, local tree departments, and commercial tree companies can do their part by being on the alert for signs and symptoms of gas leaks reporting suspected locations to the responsible gas company.

A. *Stop the Leak:* The first step, of course, in remedying gas injury is to stop the leak. This is the job of the gas company personnel who should be notified of the leak and asked to act immediately.

B. *Aerate the Soil:* The soil should be rid of the toxic gas as quickly and as completely as possible under the circumstances. This may be accomplished by leaving the repair hole or holes open for a few days, by digging a trench between the leak and nearby trees, or by making numerous bar-holes in the gassed area with a crowbar or air compressor drill and forcing air into the soil through these holes with an air compressor. When the latter procedure is followed one must be sure that there are ample holes around the periphery of the gassed area to allow the gas to escape from the soil rather than be spread out farther by the pressure of the entering air.

In cases where the top soil is compacted, loosening it up will be of considerable help in hastening the escape of the gas.

Where the soil is strongly saturated with gas and such a step is feasible, as where a small tree is involved, it may be desirable to replace the soil entirely around the root area. This should be done especially where a replacement tree is to be planted soon after the leak has been repaired.

In most cases, as a matter of fact, no special measures are taken to aerate the soil which nevertheless eventually loses its toxicity as evidenced by the return of grass and weeds. The rapidity with which the soil recovers unaided depends on the degree of saturation with gas, the soil texture, the compactness of the soil, the amount of precipitation on the soil, and the amount of paved surface over the gassed area. These factors should be considered when deciding whether or not it is economically practical to undertake more positive measures.

C. *Fertilizing and Watering*—Heavy watering of the soil over the root area of a tree in the leak area is beneficial in at least two ways. First, the water leaches out some of the toxic materials from the soil, partly by solution and partly by displacement of the gases. Because of this latter action it is desirable to have some aeration holes scattered over the leak area. Second, the water replenishes the supply of soil moisture. Where large leaks are involved, and particularly in light sandy soil, the soil is often found to be dried out by the leaking gas.

The application of a suitable tree fertilizer prior to watering is desirable, especially where the soil is obviously poor in organic matter. The fertilizer should be of a kind which is quickly available to the tree in order that a quick boost may help overcome the weakening effect of the gas injury and thus aid in resisting secondary invaders.

D. *Pruning*—Whenever killing-back of branches has occurred the pruning of these branches is certainly called for. This will not only improve the appearance of the tree but will also remove possible infection courts of tree disease

(Continued on page 24)

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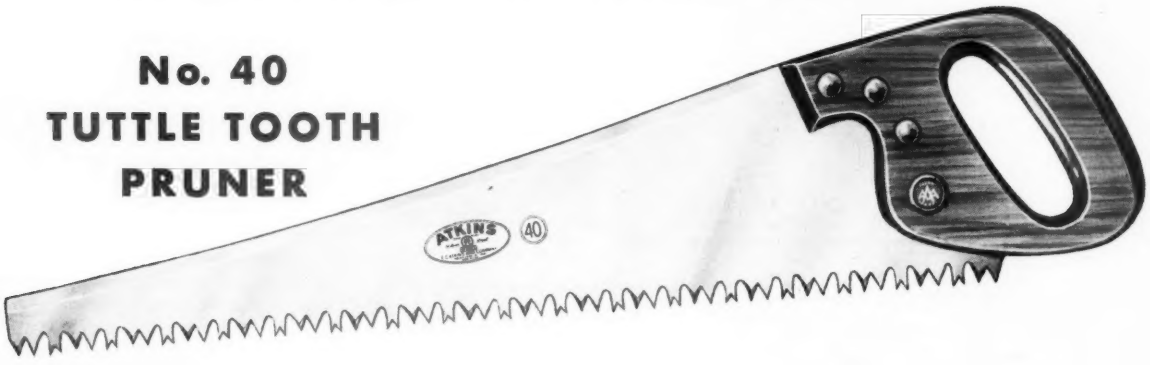

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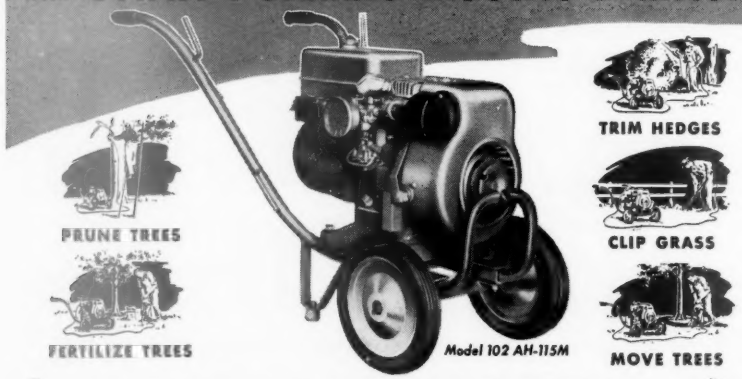

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Midwest Park Executives Meet In Chicago

The Midwest Institute of Park Executives wishes to announce that plans for its Tenth Annual Educational Conference are now in the making and the dates have been set for March 14-15, 1951.

The meeting place will be the Chicago Park District Administration Building, 424 East 14th Boulevard, Chicago, Illinois. The sessions will start at 8:30 a. m. and run to 5:00 p. m. on both days. A wide variety of subjects will be presented, designed to be of current interest to all of you, whether you work with plants, their diseases, soils, or people. Make March 14-15 red letter dates on your calendar today. The $3.00 registration fee will include a copy of the proceedings. Program Chairman is Gordon B. Wallace, Superintendent, Wilmette Park District, Wilmette, Ill.

Basal Bark Treatment of Brush

Five years of testing have proven basal bark treatment of brush and small trees to be as effective as conventional foliage applications of weed killers according to research workers at The Dow Chemical Company.

The discovery opens up new possibilities in year-around brush control according to Dow's technical service and development division. In most areas foliage treatment is possible during only four or five months of the year. The basal bark method is applicable over the full twelve months, and is limited only by severe rainfall, deep snow or exceptionally low temperatures.

The company states that various Federal and State research groups have conducted similar tests with equally promising results.

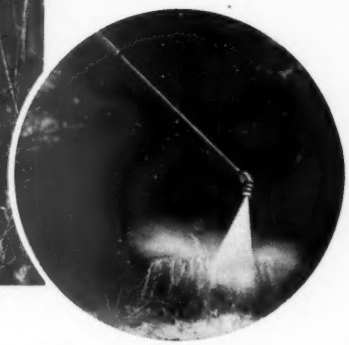
Good results have been obtained from spring, summer, fall and winter applications. The chemical 2, 4, 5-T has proved more effective than 2, 4-D for basal treatment except with a few species, such as willow, that are more susceptible to 2, 4-D.

Dow reports that best results were obtained using a mixture at the rate of 1 pint of Esteron 245 to 3 gallons of Diesel fuel or kerosene. Two factors are important to obtain the best results —the mixture should be thoroughly stirred before application and the basal area should be wet to the point of run-off. In spraying stumps to prevent re-sprouting, the bark on the sides of the stump should be wet thoroughly as well as the cut surface on the top.

Following dormant treatment some species will leaf out in what appears to be a normal manner, but the effects of treatment almost invariably show up later during the growing season. Some species will fail to leaf out or will only partially foliate and then die back.

ESTERON 245 for basal bark spraying

controls brush and trees!



Now you can plan in terms of a *year-around* brush control program! Basal bark applications with low-volatility Esteron 245 in diesel oil or kerosene have given as good control of brush as summer foliage treatment. Esteron Brush Killer, another low-volatility ester formulation, may also be used at higher concentrations.

Basal bark treatment—spraying only the basal portions of brush stems or tree trunks—controls most woody species, including those which have shown resistance to foliage sprays. The big advantage is—basal spraying may be done *any month in the year,* while foliage treatment in most locations is limited to four or five months. A second advantage is that low-cost hand equipment can be utilized. Complete coverage does the job. This means wetting thoroughly (completely encircling) the base of the stems or trunks to a height of 12 to 18 inches from the ground line. Both Esteron 245 and Esteron Brush Killer are useful also for spraying cut stumps to prevent resprouting. This, too, may be done at any time during the year, wetting the complete stump to the ground line, including all exposed bark and above-ground roots.

The *proved* success of basal bark treatment makes possible a twelve-month spraying schedule. This outstanding development is a result of extensive experiments over a five-year period by Dow's Field Research division—plus field trials under the supervision of Dow's Technical Service and Development division. Your inquiries are invited. Dow sales and technical men are available for consultation and assistance.

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DOW
CHEMICALS
INDISPENSABLE TO INDUSTRY AND AGRICULTURE

PLANT AMERICA

Gas Injury

(Continued from page 20)

pathogens, and wood-rotting fungi, and may discourage wood borers.

There is reason to believe that a moderate over-all pruning of trees which are known to have been exposed to gas injury, even though only slight or no injuries are apparent, may help to prevent or alleviate delayed effects of the gas. Reducing the volume of the crown will relieve the burden on the injured root system in supplying water and nutrients to the above-ground parts until such time as new roots may be developed.

The efficacy of root pruning injured trees is questionable, and certainly the practicability of such a procedure is very doubtful in most cases. Experiments with potted trees have shown that while root pruning retarded decay and promoted the growth of new roots, no difference in the appearance of the tops was effected (4).

E. *Check and Double Check*—In all cases it should be remembered that a repaired leak may still be leaking or a second leak in the close vicinity may be present. If this is suspected one should ask the gas company to recheck the area carefully with their gas detecting instrument.

SUMMARY

Prevent gas injury to trees by spotting leaks early. The growing season is the best time to find and repair leaks.

A general knowledge of the characteristics of gas and gas distribution system is an aid in detecting gas leaks.

Most gas leaks show up as injuries to small vegetation before symptoms on a tree are manifested. Where and how to look for leaks is described.

The absence of signs of a leak on small vegetation does not eliminate the possibility of gas injury to a tree whose roots may ramify for considerable distances. Test for gas under the pavement.

The toxic principles in illuminating gas apparently are included in the so-called "illuminants," ethylene being considered a chief offender though other constituents are implicated.

The mechanism of injury is obscure. That the injury is one to the root system and reflected in other parts of the tree is certain. Toxic principles in the gas and the physical displacement of the air in the soil may both contribute to the injury.

The usual symptoms of gas injury on trees includes sudden wilting of the foliage, off-color and undersized foliage, die-back, dead buds, and cracking and loosening of the bark.

Remedial measures for gas injury include stopping the leak, aerating the soil, fertilizing, watering and pruning.

Acknowledgements

The author expresses his gratitude to Dr. M. A. McKenzie, Director, Shade Tree Laboratories, University of Massachusetts, for his helpful criticism in the preparation of this manuscript; and to Phillip Facey, Supt. of Distribution, Northampton Gas Light Company, Northampton, Massachusetts, who edited particularly those parts pertaining to the technical aspects of gas and its distribution, D.H.M.

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(Continued on next page)

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Exotic Trees

(Continued from page 8)

serious searching to find its best forms. The other three are *tomentosum, petioloris* and *euchlora.* A particularly lovely tree that would certainly be in heavy demand if it were known is *Aesculus carnea* and its variety *Briotti.* This dainty and unusual horsechestnut with its pink or red flowers is a masterpiece of arboreal beauty. In addition it is practically fruitless, which gets around one of the great objections to *hippocastanum,* and it is not subject to the leaf scorch that makes the white variety so undesirable. There are others, many, many others, that must be reintroduced and introduced to the professionals and the public.

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Trees...

Authors and Books

The following books may be ordered from TREES Magazine, Box 5607, Cleveland, Ohio.

FOREST MENSURATION, by Donald Bruce and Francis X. Schumacher (Third Edition). McGraw-Hill Book Co., New York. 483 pp. illus. $5.00.

Highly respected in previous editions, this exceptional text has been revised to incorporate recent developments in the field. The fundamental concept of the book, however, remains unchanged; namely, that the best way to teach forest mensuration is to instruct the student in the use of its tools.

The present edition is fully up to date. All the common problems of mensuration are now illustrated by modern procedures. In general, the changes in the revision represent the addition of new material or the substitution of new for old.

New Features:

—revisions and rewriting in the chapters on log scaling, timber cruising, taper tables.

—the new form class volume tables for use with many species have been fully discussed.

—a new chapter on the mensurational phases of using aerial photographs in timber cruising.

—expansion of the section on growth and yield.

Illustrative materials and problems have been revised where necessary to correspond with new procedures described.

* * * *

A HISTORY OF HORTICULTURE IN AMERICA TO 1860, by U. P. Hedrick. Oxford University Press, New York. 551 pp. illus. $7.50.

The history is concerned with gardening, fruit growing, anad viticulture from its earliest beginning in this country through 1860, a period on which little material has previously been published. Surveying the field chronologically and geographically, the book tells the story of the development of fruits, flowers, and vegetables throughout the United States. Mr. Hedrick shows the colonists' need for food forced both professional botanists and amateurs into experimental horticulture. The work was continued by Washington, Jefferson, and other great names in our history during the early days of the nation.

The author tells of fashions in foods and flowers, points out how landscape gardening developed according to the architecture of the periods and regions. He mentions herb gardens and Quaker gardens, orchards and truck farming, and has included chapters on plant explorers and botanic gardens and on plant breeding. Written in the warm style that made *The Land of the Crooked Tree* so delightful, the book includes personal vignettes of important nurserymen in the United States.

Mr. Hedrick has gained his information from direct research, books of travel written by early European visitors, advertisements in early papers, and contemporary books and periodicals.

Authoritative for the professional, this book is also good reading for the amateur horticulturist or gardener, and for the many who are interested in Americana.

* * * *

THE TREES OF PENNSYLVANIA, by William C. Grimm. Stackpole and Heck, Inc., Harrisburg, Pa. 363 pp. illus. $5.00.

This book provides a much needed, thoroughly illustrated, and popular manual on the trees of the "Keystone State." With a few exceptions it also covers the field of the northeastern United States.

Although scientifically accurate in every detail much of the scientific terminology has been eliminated; and the few botanical terms which have been employed, for convenience sake, are adequately explained in the introductory text and in the glossary.

The book provides two sets of simple keys to tree identification; one based on summer and another on winter characteristics. With these keys it is possible to identify the trees at any season of the year.

The wealth of illustrations were made from original drawings by the author, and they faithfully portray the distinctive features of the various species of trees. All of them were drawn from Nature with such exactness of detail that practically any tree can be easily identified from the illustrations alone. The descriptive text is clear and concise, for burdensome and unnecessary details have been happily eliminated.

In these pages will be found a wealth of interesting facts about trees; their growth, habitats, and distribution. It not only discusses their commercial and ornamental value but it answers a host of questions such as these: What is the favorite food tree of the beaver? What trees provide good deer browse? From which trees do the bees obtain nectar? What happened to the chestnut? The volume contains a great many little known facts about the trees and much pleasurable reading.

A worthy successor to Illick's "Pennsylvania Trees" which has been out of print for more than two decades.

* * * *

A NATURAL HISTORY OF TREES OF EASTERN AND CENTRAL NORTH AMERICA, by Donald Culross Peattie. Houghton Mifflin Co., Boston. 606 pp. illus. by Paul Landacre. $5.00.

Here is the book you have always wanted to find, about the trees you love. Nothing like it has ever been published. First, all the information you need on each tree is presented in clear, non-technical terms; the popular and scientific names; the range; the nature and weight per cubic foot of the wood; a description of the leaf, flower, fruit, bark, with exquisite detailed drawings that make identification easy. This is followed by a wealth of fascinating lore about our trees such as has never before been gathered together.

Almost every tree in our sylva has made history, or witnessed it, or entered into our folkways, or usefully become a part of our daily life. Here you will learn what use the Indians made of bark or fruit or root, how the pioneers dealt with each tree in their forest world, and what purpose each serves in modern industry. You will read about the precious cabinet woods used in American furniture, about famous trees, like the Penn Treaty Elm or the Wye Oak, about Daniel Boone hollowing out a giant tulip poplar in which to float his family down the Ohio, and Audubon watching the passenger pigeons alight in the beeches till they broke the boughs, about Thomas Jefferson sending newfangled "Illinois-nuts" (pecans) to George Washington, to plant at Mount Vernon where they grow today.

Do you know why our word "book" comes from "beech"? What kind of tree made the mast that first carried the Stars and Stripes overseas? What wood it was that gave her name to "Old Ironsides"? *A Natural History of Trees* answers these and hundreds of other questions. For the scientific reader there is an easy botanical key and a complete index, of both English and Latin names

This is a book for a lifetime, for reference and for reading. In a changing world, trees are restfully unchanging, and Mr. Peattie has given us the book of our times about them.

Exotic Trees

(Continued from page 25)

seryman, arborist and park man; it must be awakened. One of the trees the writer has crusaded against vigorously is the Silver maple. This tree is well known to all, and so are its faults. But, we should weigh its good and bad points and seek by selection to overcome the bad. What is needed is a form with primarily structural strength, such as a pyramidal or globe form with an excurrent form. The tree shown in one of the pictures is an immense tree, probably too large for practical purposes, but it does differ from the usual form, and because it is entire, with none of the snaggy broken branches usual in a tree of this size and would seem to merit consideration where such large trees can be used. The other picture is of a very tall shapely Norway Maple. Because the Norway is such a widely used and good tree there should be at least six or eight various uses to which the tree is put.

The Shade Tree Selection Committee is composed of Dr. Donald Wyman, Horticulturist, Arnold Arboretum; Dr. Ernst J. Schreiner, Geneticist, U. S. Forest Service; Martin Chaisson, City Forester, Kansas City, Mo.; Harry Turner, City Forester, East Orange, N. J.; Henry Vaugh-Eames, Arborist, Westfield, N. J.; Hollis Howe, Arborist, Towson, Md. The writer is chairman of the committee. You are urged to dig into this most interesting and definitely badly needed program to help bring to light all of the fine exotics that must be hidden on estates and parks thruout the length and breadth of this big land of ours. The committee is working hard on the job, but its efforts are mighty puny when the territory to be covered is considered, and when the number of people who are truly interested in this project are known to exist in every nook and cranny where a good tree may be found, and who must help if we are to render a service so badly needed in this day of Oak wilt, Dutch elm disease, and other diseases that threaten our common trees.

Get busy and get those winter pictures now—8x10 glossy—with a summer picture later. Don't overlook weeping, fastigiate or globe forms—we need them all.

By this time You Know That

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Last summer should prove to you that without excessive rainfall, your dry fertilizers and plant foods were more of a detriment than a help to your trees; also, that the leaves do absorb the rain.

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Reduce Brush To Valuable Mulch

Oakland, Calif., Park Department Puts Asplundh Chipper in Service

DATA ON BRUSH CHIPPING UNIT

This chipping unit was fabricated using a basic Asplundh Chipper.

A Chrysler Industrial Engine, available from War Surplus at no cost to this department, was used for power. The Chipper runs at a speed of 3000 R.P.M. and is capable of chipping up branches to 6 inches in diameter. However, its most effective use is for brush and small limbs up to 2 inches in diameter.

The 2½-ton 1942 GMC truck was purchased from War Surplus for $1200.00, reconditioned at the Corporation Yard and equipped with a twin hydraulic hoist. This truck, together with the Chipper, forms the complete unit which will be used in the Street Tree operations of the department. The chipped-up brush will be composted for humus.

By using this equipment it will be possible to save considerable operating time which is now spent in hauling brush from the job to the burning site beyond the Alameda Golf course, as well as providing the department with valuable humus.

The total cost of the complete unit was approximately $2800.00. If purchased new it would cost in excess of $6000.00.

This is the first unit of its kind on the Pacific Coast. However, many private tree surgery companies, large orchardists and other municipalities will, we are quite sure, see the value of this Chipper and install similar equipment in their operations.

ARBORISTS, NURSERYMEN, STREET TREE AND PARK DEPARTMENTS

Asplundh Chipper Company

SUBSIDIARY OF ASPLUNDH TREE EXPERT CO.

501 York Road Jenkinstown, Penna.